Panasonic CONNECT

Model ID		NPM-D3A
PCB dimensions *1	Dual-lane mode	L 50 ㎜ × W 50 ㎜ 〜 L 510 ㎜ × W 300 ㎜
	Single-lane mode	L 50 ㎜ × W 50 ㎜ 〜 L 510 ㎜ × W 590 ㎜
PCB exchange time	Dual-lane mode	0 s * *No 0 s when cycle time is 3.6 s or less
	Single-lane mode	3.6 s * *When selecting short conveyors
Electric source		3-phase AC 200 , 220 , 380 , 400 , 420 , 480 V 2.7 kVA
Pneumatic source *2		0.5 MPa , 100 L / min（A.N.R.）
Dimensions *2		W 832 ㎜ × D 2 652 ㎜ *3 × H 1 444 ㎜ *4
Mass		1 680 kg（Only for main body : This differs depending on the option configuration.）

Placement head		Lightweight 16-nozzle head V3 (Per head)*5		Lightweight 8-nozzle head (Per head)	2-nozzle head (Per head)
		High production mode[ON]	High production mode[OFF]		
Max. speed		46 000 cph (0.078 s / chip)	38 000 cph (0.095 s / chip)	21 500 cph (0.167 s / chip)	5 500 cph (0.655 s / chip) 4 250 cph (0.847 s / QFP)
Placement accuracy(Cpk≧1)		± 37 µm / chip	± 30 µm / chip (± 25 µm / chip*6)	±30 µm / chip ±30 µm / QFP □12㎜ 〜 □32㎜ ±50 µm / QFP □12㎜ Under	± 30 µm / QFP
Component dimensions (mm)		0402 chip*7 〜 L 6 × W 6 × T 3	03015*7*8 / 0402 chip*7 〜 L 6 × W 6 × T 3	0402 chip*7 〜 L 32 × W 32 × T 12	0603 chip 〜 L 100 × W 90 × T 28
Component supply	Taping	Tape：4 / 8 / 12 / 16 / 24 / 32 / 44 / 56 ㎜			Tape：4 〜 56 / 72 / 88 / 104 ㎜
		Max.68(4 , 8 ㎜ tape , Small reel)			
	Stick	———		Max.16（Single stick feeder）	
	Tray	———		Max.20（per tray feeder）	

* Placement tact time,inspection time and accuracy
  values may differ slightly depending on conditions
*Please refer to the specification booklet for details.

*1：Due to a difference in PCB transfer reference ,
    a direct connection with NPM (NM-EJM9B) /
    NPM-W (NM-EJM2D) /NPM-W2 (NM-EJM7D)
    dual lane specs cannot be established.
*2：Only for main body
*3：Dimension D including tray feeder : 2 683 mm:
    Dimension D including feeder cart : 2 728 mm

*4：Excluding the monitor , signal tower and ceiling fan cover.
*5：Lightweight 16 NH V2 is also installable.
*6：±25 µm placement support option.（Under conditions specified by Panasonic）
*7：The 03015 / 0402 mm chip requires a specific nozzle/feeder.
*8：Support for 03015 mm chip placement is optional.
    （Under conditions specified by Panasonic : Placement accuracy ±30 µm / chip）

⚠ Safety Cautions

●Please read the User's Manual carefully to familiarize yourself with safe and effective usage procedures.
●To ensure safety when using this equipment, all work should be performed according to that as stated
 in the supplied Operating Instructions. Read your operating instruction manual thoroughly.

Panasonic Group products are built with the environment in mind.

Please check the homepage for the details.
panasonic.com/global/corporate/sustainability

Inquiries…

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●Changes in specifications and appearance may be made without notice for product improvement.
●Please contact us via our website at **https://industrial.panasonic.com/ww/r/fw**

NPM
NEXT PRODUCTION MODULAR

Manufacturing Process Innovation

Model ID **NPM-D3A**
Model No.NM-EJM6E

CE

*It may not conform to Machinery Directive
and EMC Directive in case of optional
configuration and custom-made specification.

LNB conveyor + 3 production modulars in-line setup

System evolution according to mounting changes NEW CONCEPT MACHINE

NPM — NEXT PRODUCTION MODULAR

1 High area productivity with total mounting lines
Higher productivity and quality with printing, placement and inspection process integration

2 Configurable modules allow flexible line setup
Head location flexibility with plug-and-play functions

3 Comprehensive control of lines, floor and factory with system software
Production plan support through line operation monitoring

System software

Placement heads

Lightweight 16-nozzle head V3

Lightweight 8-nozzle head

2-nozzle head

- Parts Supply Navigator option
- Feeder Setup Navigator option
- Remote operation option
- APC system
- AOI information display option
- Automatic changeover option
- Maintenance notice service

● NPM–DGS
Data Creation System

AOI

NPM-D3A
PRODUCTION MODULAR

SPI

Dual printer

DUAL SCREEN PRINTER

Automation units

Automatic tape splicing unit

Feeder maintenance unit*2

Head maintenance unit

Multi-functional transfer unit

Multi-product line
Full dual-lane mounting

The introduction of dual conveyor enables production of different types of PCBs in the same line, thus leading to increased productivity.

NPM-D3A

PCB distribution conveyor *1

DUAL SCREEN PRINTER

Supply units

Feeder cart (17 inputs)

Interchangeable

Tray feeder (20 Component types)

Tape feeder

Thin type single tape feeder

Autoload feeder

Single stick feeder

3-slot stick feeder

Stackable stick feeder (s) *3

*1:PCB traverser conveyor to be prepared by customer.
*2:The "Thin type single tape feeder" and "Autoload feeder" require the "Master jig for thin type single feeder" and "Attachment for thin type single feeder".
*3:L-sized one is available separately, depending on the component size.

NPM
NEXT PRODUCTION MODULAR

Higher area productivity through dual lane placement
Placement Heads

NPM
NEXT PRODUCTION MODULAR

Autonomous line control to maintain constant productivity and quality
Auto recovery & Line Control

Features

The introduction of light-weight 16NH V3 further advances the performance of the machine.

◆ **High production mode** (High production mode: ON)
Max. speed : 92 000 cph *1 (IPC9850 (1608) : 66 200 cph *1) / Placement accuracy : ± 37 μm

◆ **High accuracy mode** (High production mode : OFF)
Max. speed : 76 000 cph *1 / Placement accuracy : ±30 μm (Option : ±25 μm *2)

*1:Tact for 16NH V3 × 2 head
*2:Under conditions specified by Panasonic

High-accuracy placement of 03015 mm *3 components
*3:Option:Under conditions specified by Panasonic

New pickup operation algorithm helps improve efficiency in production of 0603 microchips.
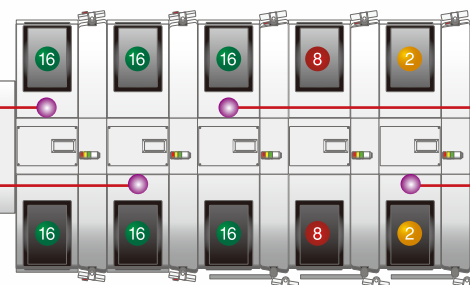
**Static stability along the x-axis improved through stiffness-based optimal design**

Improved component recognition speed by the multi-recognition camera

16 ···Lightweight 16-nozzle head V3
8 ···Lightweight 8-nozzle head   2 ···2-nozzle head

High productivity / Lightweight 16NH V3

The introduction of lightweight 16NH V3 allows the X- and Y-axes to be driven simultaneously during parts recognition , thus improving placement takt through optimal routing.

Multi-recognition camera

Feeder
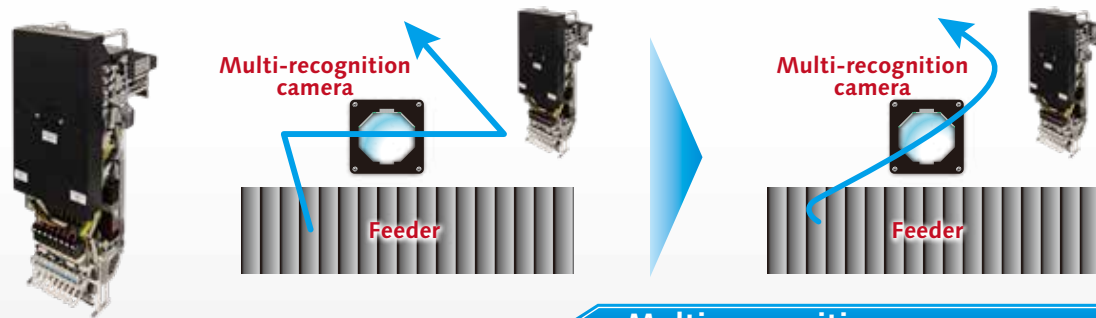
Multi-recognition camera

The three distinct recognition capabilities conventionally included in separate units have been integrated into one device. Now the three different recognition operations, including the one to detect the parts condition along their heights, can be simultaneously performed in a single scan, thus delivering continued high productivity. The device can be upgraded from 2D specs to 3D specs.
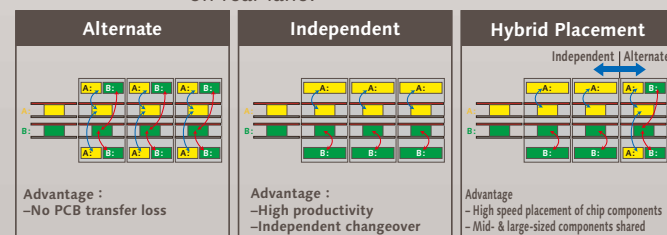
Line camera + Vertical line camera (OP) + 3D sensor (OP) → Multi-recognition camera
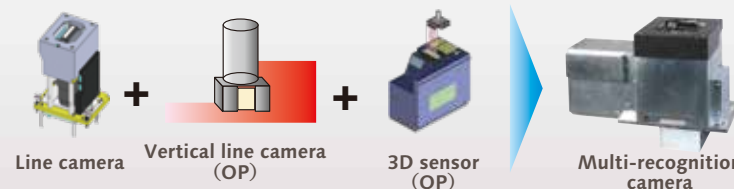
Dual mounting method

### Alternate , Independent & Hybrid Placement

Selectable "Alternate" and "Independent" dual placement method allows you to make good use of each advantage.

· Alternate : Front and rear heads execute placement on PCBs in front and rear lanes alternately.
· Independent : Front head executes placement on PCB in front lane and rear head execute placement on rear lane.

Alternate	Independent	Hybrid Placement
		Independent | Alternate
Advantage : –No PCB transfer loss	Advantage : –High productivity –Independent changeover	Advantage –High speed placement of chip components –Mid- & large-sized components shared

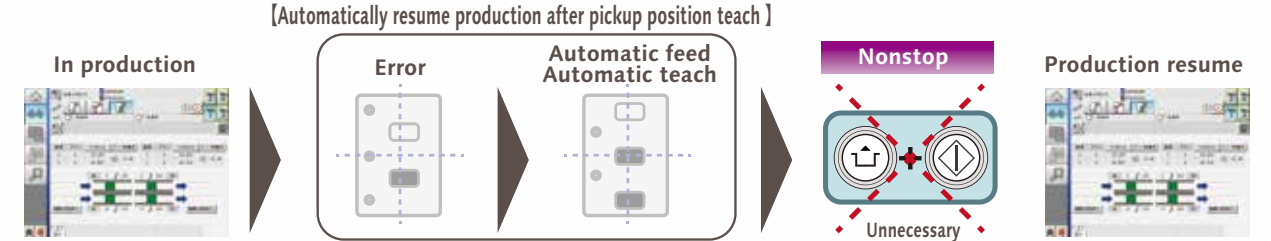### High productivity through fully independent placement

Achieved independent placement of tray components by directly linking with NPM-TT2.
Capable of fully independent placement of tray components improving cycle time of mid-, large-size component placement with 3-nozzle head. Output of entire line is enhanced.

NPM-D3A   **NPM-TT2**

PCB distribution conveyor

Dual Screen Printer
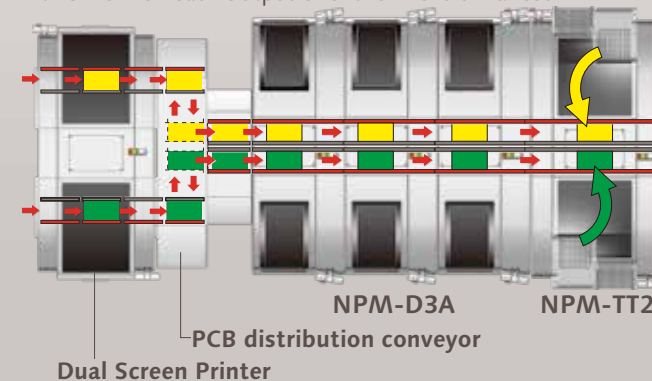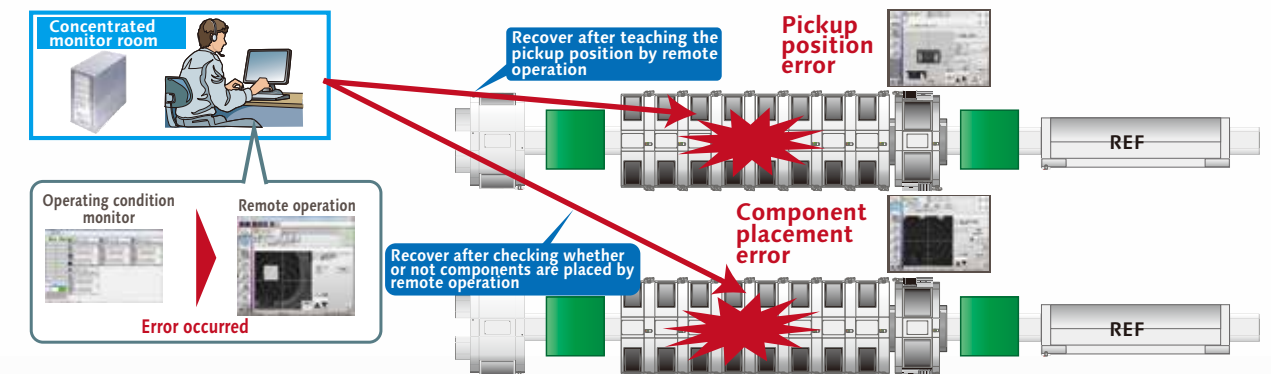

Improved availability / Automatic recovery option

This automatically adjusts the pickup position without interrupting the machine to continue production, thus enhancing machine availability.

【Automatically resume production after pickup position teach 】

In production → Error → Automatic feed Automatic teach → Nonstop (Unnecessary) → Production resume
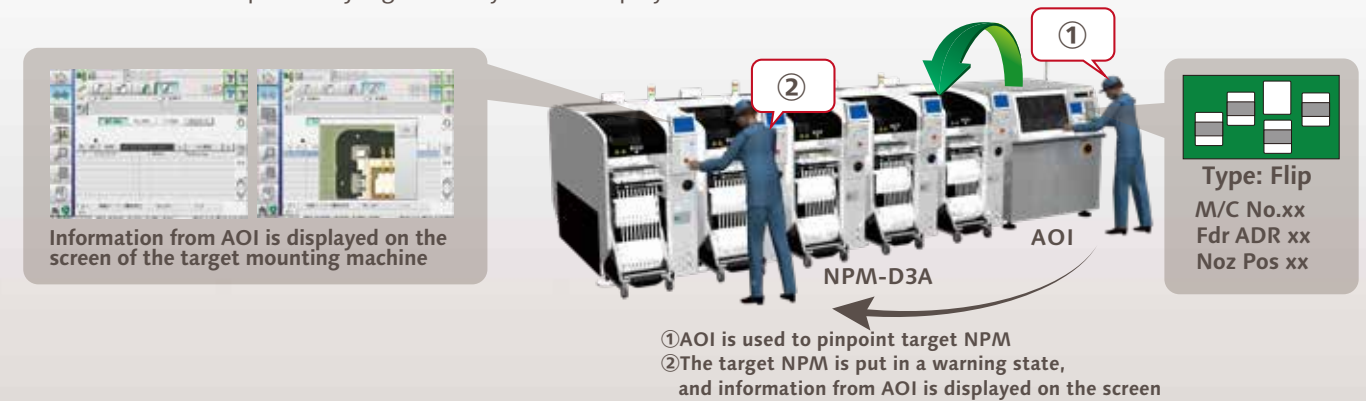
Remote operation option

Recovery by remote operation is available for the error of which recovery can be made based on human judgment alone. This enables concentrated on-the-floor monitoring, eliminating the time lost for the operator to detect error and take appropriate action , reducing the error recovery time , and thus achieving labor saving and improved operating rate.
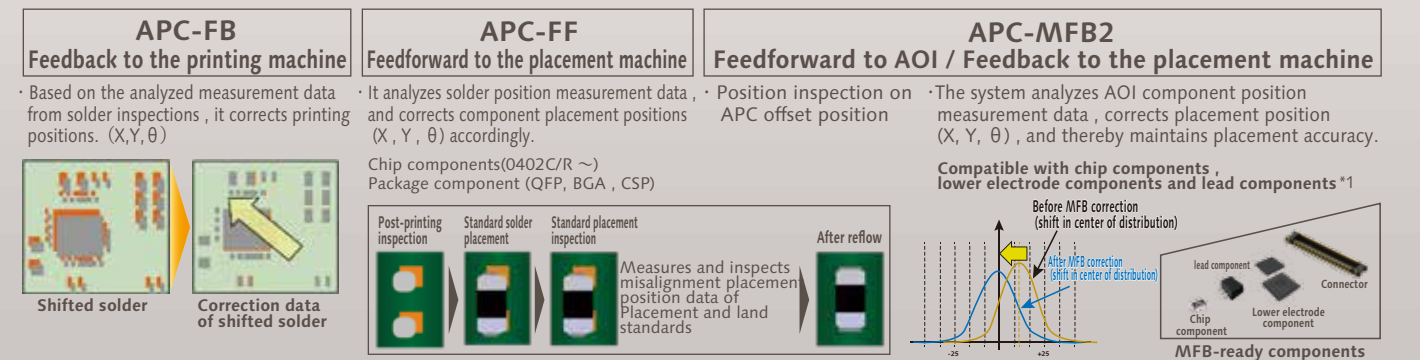
Concentrated monitor room

Operating condition monitor   **Remote operation**

Error occurred

Recover after teaching the pickup position by remote operation

Recover after checking whether or not components are placed by remote operation

Pickup position error
REF

Component placement error
REF

AOI Info Display Option

Information on components judged NG by AOI is displayed both on AOI and NPM.

Information from AOI is displayed on the screen of the target mounting machine

NPM-D3A   **AOI**

① ②

Type: Flip
M/C No.xx
Fdr ADR xx
Noz Pos xx

① AOI is used to pinpoint target NPM
② The target NPM is put in a warning state, and information from AOI is displayed on the screen

High-quality mounting / APC system

APC-FB Feedback to the printing machine	APC-FF Feedforward to the placement machine	APC-MFB2 Feedforward to AOI / Feedback to the placement machine
· Based on the analyzed measurement data from solder inspections , it corrects printing positions. (X,Y,θ)	· It analyzes solder position measurement data , and corrects component placement positions (X , Y , θ) accordingly. Chip components(0402C/R ～) Package component (QFP, BGA , CSP)	· Position inspection on APC offset position · The system analyzes AOI component position measurement data , corrects placement position (X, Y, θ) , and thereby maintains placement accuracy.

Shifted solder   **Correction data of shifted solder**

Post-printing inspection   Standard solder placement   Standard placement inspection   After reflow

Measures and inspects misalignment placemen position data of Placement and land standards

Compatible with chip components , lower electrode components and lead components *1

Before MFB correction (shift in center of distribution)

Shift in placement position
Basic concept regarding MFB correction

lead component   Connector
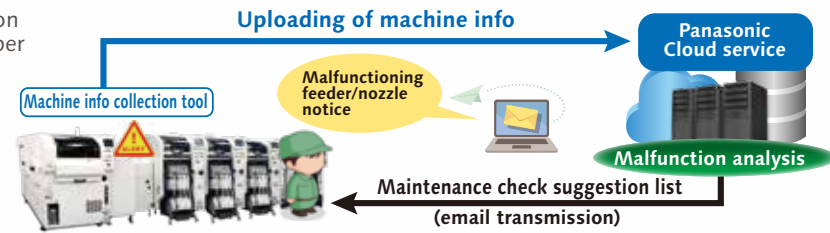Chip component   Lower electrode component

MFB-ready components

*1:APC-MFB2 (mounter feedback2): Applicable component types vary from one AOI vendor to another. (Please ask your local sales representative for details.)

Maintenance/Preservation / Maintenance notice service [*1]

Cloud-based contractual service. It makes malfunction analysis based on machine info uploaded by subscriber to our cloud to find any feeder or nozzle[*2] that requires condition check , and then sends a maintenance check suggestion list containing the analysis result to the subscriber.

*1: Maintenance service agreement must be concluded with us.
    (for details, contact our sales representative.)
*2: Only Panasonic nozzles with 2D code are applicable.

Uploading of machine info

Machine info collection tool

Malfunctioning feeder/nozzle notice

Panasonic Cloud service

Malfunction analysis

Maintenance check suggestion list (email transmission)

Head diagnosis option

It automatically self-diagnoses placement heads on a regular basis and stores diagnosis histories. Keeping track of any change in the condition of each head , it performs preventive maintenance of the head, reducing losses resulting from heads and sudden machine shutdowns.

Machine head diagnosis screen

LNB history save screen

Off-line setup support station

With the support stations, offline feeder cart setup is possible even outside of the manufacturing floor.

●**Two types of Support Stations are available.**

①Component verification station
・ Batch Exchange Cart Setup: Provides power to all feeders in cart.
・ Feeder setup: Provides power to individual feeders.
・ Component verification: Navigator that indicates any location where feeders need exchange.

②Power supply station
The simpler type of station composed of the batch exchange cart setup and the feeder setup features.

Misplacement prevention

Component Verification option

Prevents setup errors during changeover Provides an increase of production efficiency through easy operation

*Wireless scanners and other accessories to be provided by customer

●**Preemptively deters component misplacement**
Prevents misplacement by verifying production data with the barcode information on changeover components.

●**Automatic setup data synching function**
The machine itself does the verification, eliminating the need to select separate setup data.

●**Interlock function**
Any problems or lapses in verification will stop the machine.

●**Navigation function**
A navigation function to make the verification process more readily understandable.

LCR checker option

At the start of production or during component supply, it checks mounted component values, thereby preventing misplacement. It contributes to improving machine availability through a reduction in time spent on component checks , as well as manufacturing conforming items.

Nozzle

Component holding lever

Chip component (L/C/R/D)

Contact block

Component placement

Contact block

LCR checker

Component size	0402 ~ □6 mm
Component	Resistance , Capacitor , Inductor, Diode

●**Misplacement prevention function**
This prevents any misplacement due to components loaded on wrong feeders , defective components , or mislabeled reels.
Since the relevant unit inside the machine automatically checks the conditions of components , the operator can reduce time spent on component checks.

●**Interlock function**
If any checked value exceeds the maximum permissible retry count , this brings the machine to a stop.

●**Trace management function**
As checked value data is retained in LNB (FA PC), it can be made available for inspection later. Additionally , it is possible to output such data as a file. Thus, it can also be used to keep track of any changes or histories of mounted components.

Changeover ability / Automatic changeover option

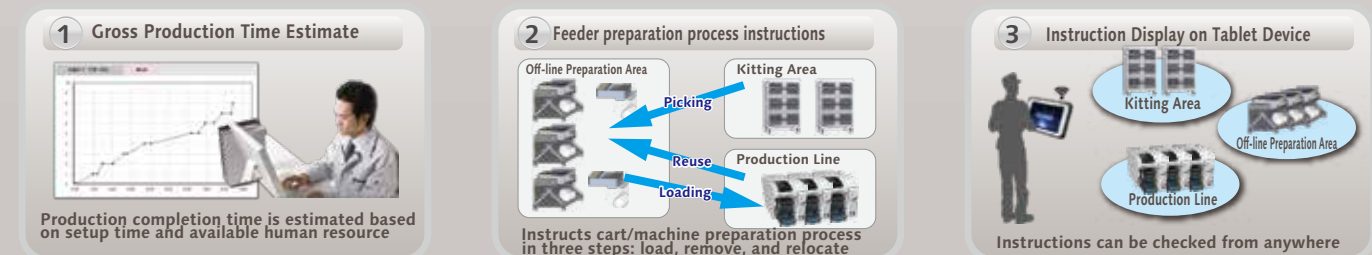Supporting changeover (production data and rail width adjustment) can minimize time loss
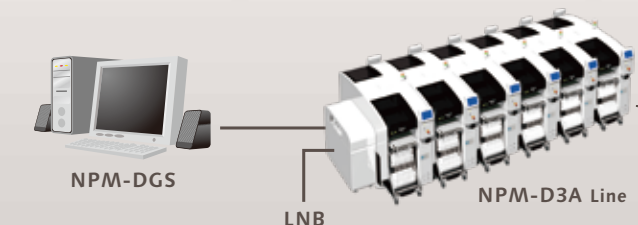
●**PCB ID read-in type**
PCB ID read-in function is selectable from among 3 types of external scanner , head camera or planning form

NPM-DGS

LNB

NPM-D3A Line
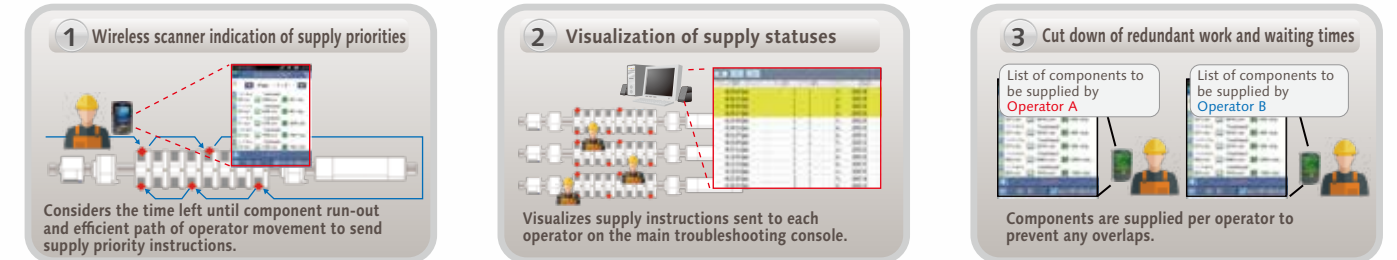
External scanner   Head Camera   Planning form
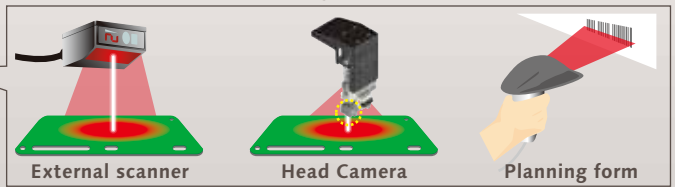
Feeder setup navigator option

It is a support tool to navigate efficient setup procedure. The tool factors in the amount of time it takes to perform and complete setup operations when estimating the time required for production and providing the operator with setup instructions. This will visualize and streamline setup operations during setup for a production line.

1 Gross Production Time Estimate

Production completion time is estimated based on setup time and available human resource

2 Feeder preparation process instructions

Off-line Preparation Area   Kitting Area

Picking

Reuse   Production Line

Loading

Instructs cart/machine preparation process in three steps: load, remove, and relocate

3 Instruction Display on Tablet Device

Kitting Area

Off-line Preparation Area

Production Line

Instructions can be checked from anywhere

Operating rate improvement / Parts supply navigator option

A component supply support tool that navigates efficient component supply priorities. It considers the time left until component run-out and efficient path of operator movement to send component supply instructions to each operator. This achieves more efficient component supply.
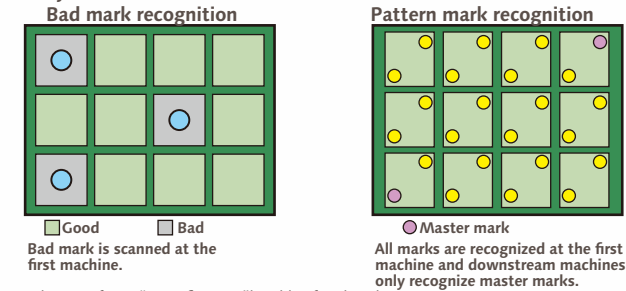
1 Wireless scanner indication of supply priorities

Considers the time left until component run-out and efficient path of operator movement to send supply priority instructions.

2 Visualization of supply statuses

Visualizes supply instructions sent to each operator on the main troubleshooting console.

3 Cut down of redundant work and waiting times

List of components to be supplied by Operator A

List of components to be supplied by Operator B

Components are supplied per operator to prevent any overlaps.

*PanaCIM is required to have operators in charge of supplying components to multiple production lines.

PCB info communication function

Information of mark recognitions done on first NPM machine in line is passed on to downstream NPM machines. Which can reduce cycle time utilizing the transferred information.
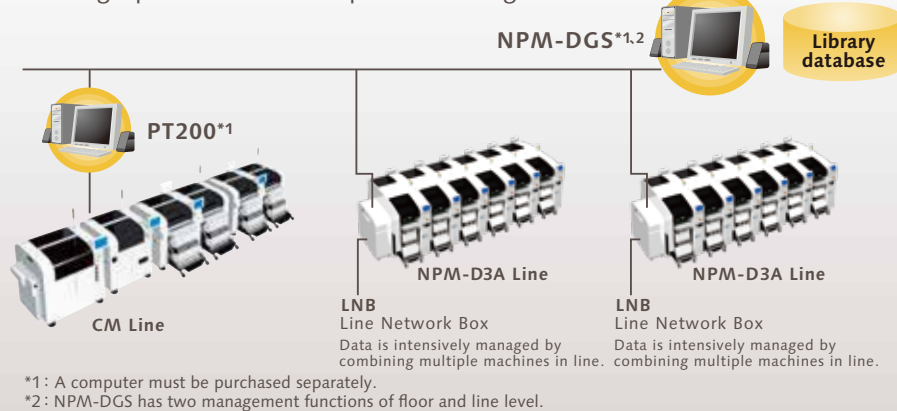
[Subject for communication]

Bad mark recognition

Pattern mark recognition

Mark recognition

☐Good   ☐Bad   ○Master mark

Bad mark is scanned at the first machine.

All marks are recognized at the first machine and downstream machines only recognize master marks.

*Please refer to"Specification"booklet for details.

Data Creation System / NPM-DGS（Model No.NM-EJS9A)

This is a software package that provides integrated management of component library and PCB data , as well as production data that maximizes mounting lines with high-performance and optimization algorithms.

NPM-DGS[*1.2]

Library database

PT200[*1]

CM Line

NPM-D3A Line

LNB Line Network Box
Data is intensively managed by combining multiple machines in line.

NPM-D3A Line

LNB Line Network Box
Data is intensively managed by combining multiple machines in line.

*1 : A computer must be purchased separately.
*2 : NPM-DGS has two management functions of floor and line level.

CAD import
Allows you to import CAD data and check polarity, etc., on the screen.

Optimization
Realizes high productivity and also allows you to create common arrays.

PPD editor
Update production data on PC during production to reduce the loss of time.

Component library
Allows unified management of the component library including mounting, inspection and dispensing.

Offline Camera（option)

Component data can be created offline even while the machine is in operation.
Use the line camera to create component data. Lighting conditions and recognition speed can be confirmed in advance, so it contributes to the improvement of productivity and quality.

Offline Camera Unit

DGS Automation（option)

Automated manual routine tasks reduce operation errors and data creation time.
Manual routine tasks can be automated.
By collaborating with the customer system, the routine tasks for creating data can be reduced, so it contributes to a significant reduction in production preparation time.
It also includes the function to automatically correct the coordinates and angle of the mounting point (Virtual AOI).

Example of entire system image:

Customer system

Work content instructions

Auto-run

NPM-DGS

Automated tasks (excerpt)
・ CAD import
・ Offset mark setting
・ PCB chamfering
・ Mounting point misalignment correction
・ Job creation
・ Optimization
・ PPD output
・ Download

Optimization of setup（option)

In production involving multiple models , setup workloads are taken into account and optimized.
For more than one PCB sharing common component placement, multiple setups may be required due to a shortage of suppy units. In order to reduce the required setup workloads in such a case, this option divides PCBs into similar component placement groups , selects a table(s) for setup and thus automates component placement operation.
It contributes to improving setup performance and reducing production preparation time for customer manufacturing various kinds of products in small quantities.

Example:

☐Setup group ●Setup table

Line

Line

PCB

A	C
B	D

Group 1   Group 2   Group 3

B	D	C	A